REMARKS

Applicants respectfully request reconsideration of this application.

The Title has been amended to more specifically describe the claimed invention.

Claims 39-52 and 60-73 are pending in the application. Claims 39-52, 60, and 61 are allowed.

Claims 68 and 69 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being vague and indefinite in the recitation of "amplified" copies of HIV-1 DNA, since the nature of the amplification is not provided. Applicants traverse the rejection.

Applicants submit that the phrase "amplified copy" defines applicants' subject matter with a reasonable degree of particularity and distinctness as required by 35 U.S.C. § 112, second paragraph. Applicants were the first to create a cDNA clone of the genome of HIV-1. The possession of this clone enabled applicants to generate amplified copies of HIV-1 DNA fragments using molecular techniques. The skilled artisan would recognize that an "amplified copy" of an HIV-1 DNA fragment would include any copy of a HIV-1 DNA fragment that was amplified, regardless of how it was amplified. Applicants submit that, since the metes and bounds of the claimed invention are clearly ascertainable, the claims cannot be properly rejected as "vague and indefinite" under 35 U.S.C. § 112, second paragraph. Accordingly, applicants respectfully request withdrawal of the rejection. *See In re Gardiner*, 427 F.2d 786, 788, 166 U.S.P.Q. 138, 140 (C.C.P.A. 1970).

Claims 62-73 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter, which was not described in the specification in such a way as to

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reasonably convey to the skilled artisan that the inventors had possession of the claimed invention at the time the application was filed. The Office concedes that the specification describes hybridization conditions similar to the claimed hybridization conditions. (Paper No. 29 at 2-3.) The Office alleges that these conditions were discussed in reference to hybridization assays performed between the three isolated HIV-1 clones and cloned HTLV-II DNA, and that the purpose of this hybridization assay was to assess the genetic relatedness of the identified HIV-1 clones to that of other viruses. The Office further contends that the specification does not describe hybridization assays involving λJ19 restriction fragments and any other HIV-1 clones; fails to describe any other nucleic acids with the exception of λJ19, λ27, and λ81; and does not provide any restriction maps or nucleotide sequences of any other HIV-1 isolate. The Office also alleges that the specification fails to describe the preparation of amplified DNA fragments. The Office concludes that the skilled artisan would not reach the conclusion that applicants' contemplated isolating and purifying other HIV-1 fragments that hybridize under the precise conditions claimed.

Applicants traverse the rejection. In order to determine the appropriate disclosure of an application, the specification as a whole must be considered. *In re Wright*, 866 F.2d 422, 424, 9 U.S.P.Q.2d 1649, 1651 (Fed. Cir. 1989). Furthermore, there is no particular way in which the disclosure must convey the required information to one skilled in the art. *See id.* Thus, one must peruse the full scope of the disclosure, the working examples, the stated objectives, and all of the embodiments in order to determine whether in some way the written description conveys the invention to one skilled in the art. When this is done for the full disclosure in this case,

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applicants' specification meets the written description requirement of 35 U.S.C. § 112, first paragraph.

As described on page 1 of the specification, applicants' invention encompasses "cloned DNA sequences hybridizable to genomic RNA and DNA" of HIV-1. (Specification at 1, lines 1-4.) Applicants further described that the invention encompasses "any of the fragments . . . which seems to correspond to part of the whole of the LAV retroviral genome . . . . " (*Id.* at 3, lines 28-32.) Applicants also described that the invention encompasses "any fragment corresponding to the above ones . . . all of these fragments having in common the capability of hybridizing with the LAV retroviral genomes." (*Id.* at 5, lines 10-15.) Consequently, the skilled artisan would immediately recognize that applicants contemplated a large genus of DNAs that hybridized to the genomic DNA of HIV-1, and that the genus included HIV-1 fragments.

Furthermore, applicants' original claims were directed to DNAs and DNA fragments, including restriction fragments, hybridizable with genomic RNA of HIV-1. (*See* Specification at 19-21.) For example, original claim 1 recited: "A cloned DNA which contains a DNA which is hybridizable with the genomic RNA of the LAV viruses or a fragment of said hybridizable DNA." Original claims 12-14 recite fragments containing specific restriction sites. There can be no doubt that applicants contemplated HIV-1 DNA fragments, including cloned fragments and restriction fragments, that hybridized to the genomic DNA of HIV-1.

Furthermore, the skilled artisan would recognize that a wide variety of hybridization conditions, including stringent and non-stringent conditions could be used for hybridization of HIV-1 fragments and the genomic DNA of HIV-1. The skilled artisan would further recognize

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that non-stringent conditions specifically disclosed in the specification would, of course, be encompassed by the invention.

The Office has presented no reasons to the contrary. A lack of literal support alone is not sufficient to support a rejection under 35 U.S.C. § 112, first paragraph. *In re Wertheim*, 541 F.2d 257, 265, 191 U.S.P.Q. 90, 98 (C.C.P.A. 1976). The burden of showing that the claimed invention is not described in the specification rests on the Office in the first instance, and it is up to the Office to give reasons why a description not in *ipsis verbis* is insufficient. *Id.* The Office has not fulfilled its burden since no reasons have been provided that the skilled artisan would not recognize in applicant's disclosure a description of fragments that hybridize to HIV-1 genomic DNA under the claimed hybridization conditions. Accordingly, applicants respectfully request withdrawal of the rejection.

Furthermore, applicants describe that cloned HIV-1 genomic DNA (λJ-19) hybridized to all five *Hind*III restriction fragments of λJ-81 (another genomic DNA clone) under stringent conditions. (*See* Specification at 10-11, bridging paragraph.) Genomic clones λJ19 and λJ81 were deposited at the C.N.C.M. on September 11, 1984. (*Id.* at 14, paragraph 5). The specification teaches that the DNA insert of pLAV13 hybridizes to λJ19. (*Id.* at 9-10). Consequently, the skilled artisan would clearly recognize that applicants contemplated isolating and purifying HIV-1 fragments that hybridize to the genomic DNA of HIV-1 under stringent hybridization conditions.

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Applicants further describe that the cloned HIV-1 genomic DNA does not cross-hybridize with a number of other viral genomes, even under non-stringent conditions of 20% formamide, 8X SSC, at 37°C, with washes in 2X SSC, 0.1%SDS, at 37°. (*See* Specification at 12, first paragraph.) Having read applicants' description of non-stringent hybridization conditions, under which HIV-1 genomic DNA did not cross-hybridize with other viral genomes, the skilled artisan would immediately recognize that these hybridization conditions were contemplated by applicants for the hybridization of HIV-1 genomic DNA with HIV-1 fragments. Since stringent condition could be used, non-stringent hybridization conditions could, of course, be used. Therefore, having read applicants' specification **as a whole**, the skilled artisan would recognize that applicants contemplated isolating and purifying HIV-1 fragments that hybridize to the genomic DNA of HIV-1 under non-stringent conditions, including specific hybridization conditions of 20% formamide, 8X SSC, at 37°C, with washes in 2X SSC, 0.1%SDS, at 37°.

In addition, the written description requirement of 35 U.S.C. § 112, first paragraph, is not violated just because a claim is broader than the specific embodiment disclosed in a specification. *See In re Rasmussen*, 650 F.2d , 1214, 211 U.S.P.Q. 323, 326-27 (C.C.P.A. 1981). Every species in a genus need not be described in order for a genus to meet the written description requirement. *See Utter v. Hiraga*, 845 F.2d 993, 998-99, 6 U.S.P.Q.2d 1709, 1724 (Fed. Cir. 1988). Rather, a description of a genus may be achieved by means of a recitation of a representative number of species falling within that genus. *See Regents of the Univ. of Cal. v. Eli Lilly*, 119 F.3d 1559, 1566, 43 U.S.P.Q.2d 1398, 1404 (Fed. Cir. 1997).

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The specification teaches the cloning of HIV-1 fragments and genomic DNA. (Specification. at 5-11). The specification teaches that λJ19 and λJ81 are genomic clones of HIV-1 DNA. (*Id.* at 9-11). The specification teaches that all of the *Hind*III restriction fragments of λJ81 DNA hybridize under stringent hybridization and washing conditions to λJ19 DNA. (*Id.* at 11, paragraph 1). Therefore, the skilled artisan would recognize that the invention encompasses DNA fragments, consisting of restriction fragments, which hybridize to HIV-1 genomic DNA.

Furthermore, the specification provides restriction maps of the entire HIV-1 genome. (*Id.* at 4 and Figs. 1 and 2). The restriction maps provided in Figs. 1 and 2 must be considered part of applicants' written description. *See Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1561, 19 U.S.P.Q.2d 1111, 1118 (Fed. Cir. 1991). Consequently, the skilled artisan would recognize that applicants had possession of all of the HIV-1 restriction fragments depicted in Figs. 1 and 2.

preliminary restriction map of λ clones

In Figs. 1 and 2, applicants describe a genus of HIV-1 fragments, which would be expected to hybridize to HIV-1 genomic DNA under the claimed conditions. The skilled artisan would further recognize that the HIV-1 restriction fragments depicted in Figs. 1 and 2 were representative of a genus of HIV-1 fragments that hybridize to HIV-1 genomic DNA under the claimed conditions. Since applicants recited a representative number of species falling within the genus of HIV-1 fragments that hybridize to HIV-1 genomic DNA, applicants' specification provides an adequate written description of the claimed HIV-1 fragments. *See Eli Lilly*, 119 F.3d at 1566, 43 U.S.P.Q.2d at 1404.

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Furthermore, the sufficiency of applicants' description must be judged as of the filing date. *See Vas-Cath*, 935 F.2d at 1562, 19 U.S.P.Q.2d at 1119. Therefore, as detailed in applicants' July 16, 1999, Amendment and Response to Paper No. 26, the variability of HIV-1, which was determined after applicants' filing date, is irrelevant to whether the skilled artisan would conclude that applicants had possession of the claimed invention at the time the application was filed. *See id.* Consequently, applicants' description of a large genus of HIV-1 fragments that hybridize to HIV-1 genomic DNA would have conveyed to the skilled artisan that applicants had possession of the claimed invention at the time the application was filed. Accordingly, applicants respectfully request withdrawal of the rejection.

Moreover, applicants described amplified HIV-1 fragments. For example, the specification describes the small-scale amplification of clones containing HIV-1 fragments and hybridization of their inserts:

> A major family was obtained by small-scale amplification of clones and cross-hybridization of their inserts. Among these clones a major family of hybridizing recombinants was identified. Three of these cDNA clones, named pLAV 13, 75, and 82, carrying inserts of 2.5, 0.6, and 0.8 kb respectively were further characterized (fig. 1).

(Specification at 7, lines 9-11.) The specification also states:

> The invention also relates more specifically to cloned probes which can be made starting from any DNA fragment according to the invention, thus to recombinant DNAs containing such fragments, particularly any plasmid amplifiable in procaryotic or eukaryotic cells and carrying said fragment. As mentioned earlier a preferred DNA fragment is LAV 13.

(*Id.* at 12, lines 8-14.)

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Having read these passages from the specification, the skilled artisan would conclude that applicants had possession of the claimed amplified HIV-1 fragments. Accordingly, applicants respectfully request withdrawal of the rejection.

Claims 53-61 were rejected under 35 U.S.C. § 112, first paragraph, because the specification allegedly does not reasonably enable the skilled artisan to make and/or use the invention commensurate in scope with the claims. The Office alleges that the specification fails to provide adequate guidance, and concludes that undue experimentation would be required to practice the claimed invention. Specifically, the Office contends that the specification does not disclose other HIV-1 isolates or restriction fragments obtained from any other HIV-1 isolates that are capable of hybridizing under the claimed conditions. The Office relies upon the disclosures of Goodenow *et al.*, Holland *et al.*, and Gao *et al.* as "prior art" to demonstrate that the skilled artisan would have been unable to predict the restriction map or nucleotide sequence of any given HIV-1 isolate. The Office further contends that "it is also acceptable to submit later-dated references if they provide evidence as to what was known on or before the effective filing date of the application." (Paper No. 29 at paragraph 2.) The Office concludes that "if individuals skilled in the art state that a particular invention is not feasible after the filing date of the claimed invention, that would be sufficient evidence that the invention was not possible at the time of filing." (*Id.*) The Office disregards applicants' arguments regarding enablement, citing *In re Budnick.*

Applicants traverse the rejection. Applicants again submit that the Office has improperly relied on the disclosures of Goodenow *et al.*, Holland *et al.*, and Gao *et al.* These references

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were published after applicants' effective filing date. Therefore, Goodenow *et al.*, Holland *et al.*, and Gao *et al.* **cannot be considered "prior art"**. Furthermore, Goodenow *et al.*, Holland *et al.*, and Gao *et al.* do not provide any evidence as to what was known on or before applicants' effective filing date that would show non-enablement of applicants' invention. None of these references show that applicants' invention was not possible at the time of filing. Consequently, the Office's reliance on these references is improper.

Furthermore, later discoveries of unknown variations cannot render the claims non-enabled. *See In re Hogan*, 559 F.2d 595, 605, 194 U.S.P.Q. 527, 537 (C.C.P.A. 1977). Otherwise, the opportunity for obtaining a basic patent upon early disclosure of a pioneer invention would be abolished. *Id.* Similarly, the later discovery of the genotypic variability of HIV-1, **which was unknown to the skilled artisan at the time the application was filed**, does not render the applicants' claims non-enabled. *See id.* Accordingly, applicants submit that claims 62-73 are fully enabled, and that Goodenow *et al.*, Holland *et al.*, and Gao *et al.* are not relevant to enablement of the claimed invention.

Moreover, the Office has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557, 1561, 27 U.S.P.Q. 2d 1510, 1515 (Fed. Cir. 1993). Applicants respectfully submit that the Office has not met this burden, since no evidence has been presented supporting the conclusion that the skilled artisan would have questioned the enablement of the claimed invention at the time the application was filed.

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In contrast, applicants submitted Exhibits 1-11 with the Amendment and Response to Paper No. 26 filed July 16, 1999. These Exhibits provide objective evidence in support of the enablement of applicants' invention at the time the application was filed, and cannot be considered mere "argument of counsel." Consequently, applicants respectfully submit that the Office has improperly disregarded this objective evidence in the consideration of the enablement of applicants' invention, and request that these references be considered by the Office. *See In re Alton*, 76 F.3d 1168, 37 U.S.P.Q.2d 1578 (Fed. Cir. 1996) (finding error in the Office's lack of consideration of factual evidence submitted to counter a 35 U.S.C. § 112 rejection.).

Applicants are not required to disclose every species encompassed by their claims, even in an unpredictable art. *In re Angstadt*, 537 F.2d 498, 502, 190 U.S.P.Q. 214, 218 (C.C.P.A. 1976). Rather, applicants can meet the sufficiency of disclosure through illustrative examples by teaching the skilled artisan to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility. *In re Vaeck*, 947 F.2d 488, 496, 20 U.S.P.Q. 2d 1438, 1445 (Fed. Cir. 1991). Applicants submit that the specification teaches the skilled artisan which HIV-1 DNA fragments are within the claimed invention. Accordingly, applicants submit that claims 62-73 are fully enabled and respectfully request withdrawal of the rejection.

Additionally, applicants submit that the finality of the October 28, 1999, Office Action is **PREMATURE**, and respectfully request **withdrawal of the finality** of the action. M.P.E.P. § 706.07 states:

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> In making the final rejection, all outstanding grounds of rejection of record should be carefully reviewed, and any such grounds relied on in the final rejection should be reiterated. They must also be clearly developed to such an extent that applicant may readily judge the advisability of an appeal unless a single previous Office action contains a complete statement supporting the rejection. However, where a single previous Office action contains a complete statement of a ground of rejection, the final rejection may refer to such a statement and **also should include a rebuttal of any arguments raised in the applicant's reply**.

In addition, M.P.E.P. § 707.07 states: "The examiner **must address all arguments** which have not already been responded to in the statement of the rejection." Furthermore, M.P.E.P. § 707.07(f) states: "Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, **take note of the applicant's argument and answer the substance of it."**

The final Office Action dated October 28, 1999, did not rebut or answer applicants' arguments (supported by objective evidence, Exhibits 1-11) concerning the enablement and written description of the claimed invention. Applicants' arguments, together with the objective evidence, appears to have been disregarded as mere "argument of counsel." (See Paper No. 28 at 6.)

However, applicants arguments were not mere "argument of counsel." Applicants supported their arguments with objective evidence in the form of Exhibits 1-11. Accordingly, until the Office provides a rebuttal of applicants' arguments, the FINALITY of the Office Action dated October 28, 1999, is PREMATURE. Accordingly, applicants respectfully request reconsideration and withdrawal of the finality of the rejection.

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Applicants submit that the application is now in condition for allowance. If the Examiner disagrees, applicants invite the Examiner to contact the undersigned to discuss any remaining issues.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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By _____
Kenneth J. Meyers
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Dated: February 25, 2000

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